

AMENDMENT TO THE CLAIMS

The following claim listing replaces all prior listings and versions of the claims:

LISTING OF CLAIMS

1. (Currently Amended) A spring steel wire having a tempered martensitic structure brought about by quenching-tempering following patenting and drawing, the spring steel wire comprising:

based on mass %, C: 0.50-0.75%, Si: 1.80-2.70%, Mn: 0.1-0.7%, Cr: 0.70-1.50%, Co: 0.02-1.0%, and balance consisting of Fe and impurities;
a 40% or higher reduction of area after quenching-tempering; and
a 1,000 MPa or higher shear yield stress when evaluated under condition in which the wire is subjected to heat treatment for at least 2 hours at a temperature ranging from 420°C to 480°C.

2. (Cancelled)

3. (Currently Amended) The spring steel wire according to claim 1 consisting of, A
spring steel wire having a tempered martensitic structure brought about by quenching-tempering
following patenting and drawing, the spring steel wire comprising:

based on mass %, C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%,
and balance consisting of Fe and impurities without including Ni and V;
a 40% or higher reduction of area after quenching-tempering; and

a 1,000 MPa or higher shear yield stress when evaluated under condition in which the wire is subjected to heat treatment for at least 2 hours at a temperature ranging from 420°C to 480°C.

4. (Cancelled)

5. (Currently Amended) The spring steel wire according to claim 1, further comprising consisting of, based on mass %[[;]],
~~C: 0.50-0.75%, Si: 1.80-2.70%, Mn: 0.1-0.7%, Cr: 0.70-1.50%, Co: 0.02-1.00%;~~
at least one element selected from the group of 5 elements consisting of V: 0.05-0.50%,
Mo: 0.05-0.50%, W: 0.05-0.15%, Nb: 0.05-0.15% and Ti: 0.01-0.20%; and
balance consisting of Fe and impurities.

6. (Currently Amended) The spring steel wire according to claim 3, further comprising 1 consisting of, based on mass %[[;]],
~~C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%;~~
at least one element selected from the group of [[5]] 4 elements consisting of V: 0.05-0.50%, Mo: 0.05-0.50%, W: 0.05-0.15%, Nb: 0.05-0.15% and Ti: 0.01-0.20%; and
balance consisting of Fe and impurities.

7. (Cancelled)

8. (Currently Amended) The spring steel wire according to claim 1, further comprising austenite grains (prior austenite grains) which have an average grain size in the range of 3.0-7.0 μm .

9. (Previously presented) A spring manufactured from the spring steel wire according to claim 1.

10. (Original) A spring manufactured from the spring steel wire according to claim 8.

11. (Withdrawn) A method of manufacturing a spring steel wire, comprising the steps of:

patenting a steel consisting of chemical compositions given below;

drawing the thus patented steel into a steel wire; and

subjecting the resultant steel wire to quenching-tempering;

wherein said patenting process comprises:

an austenization step in which the steel is heated at 900-1,050°C for 60 to 180 seconds; and

an isothermal transformation step in which the thus austenized steel is heated at 600-750°C for 20 to 100 seconds;

Chemical compositions (based on mass %):

C: 0.50-0.75%, Si: 1.80-2.70%, Mn: 0.1-0.7%, Cr: 0.70-1.50%, Co: 0.02-1.00%, and remnants consisting of Fe and impurities.

12. (Withdrawn) A method of manufacturing a spring steel wire, comprising the steps of:

patenting a steel consisting of chemical compositions given below;

drawing the thus patented steel into a steel wire; and

subjecting the resultant steel wire to quenching-tempering;

wherein said patenting process comprises:

an austenization step in which the steel is heated at 900-1,050°C for 60 to 180 seconds; and

an isothermal transformation step in which the thus austenized steel is heated at 600-750°C for 20 to 100 seconds;

Chemical compositions (based on mass %):

C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%, and remnants consisting of Fe and impurities.

13. (Withdrawn) A method of manufacturing a spring steel wire, comprising the steps of:

patenting a steel consisting of chemical compositions given below;

drawing the thus patented steel into a steel wire; and

subjecting the resultant steel wire to quenching-tempering;

wherein said patenting process comprises:

an austenization step in which the steel is heated at 900-1,050°C for 60 to 180 seconds; and

an isothermal transformation step in which the thus austenized steel is heated at 600-750°C for 20 to 100 seconds;

Chemical compositions (based on mass %):

C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%, at least one element of Ni: 0.1-1.0% and Co: 0.02-1.00%, and remnants consisting of Fe and impurities.

14. (Previously Presented) The spring steel wire according to claim 1, wherein the patenting comprises austenitization step in which a steel is heated at 900-1,050°C for 60 to 180 seconds and an isothermal transformation step in which thus austenitized steel is heated at 600-750°C for 20 to 100 seconds.

15. (New) The spring steel wire according to claim 3 comprising austenite grains (prior austenite grains) which have an average grain size in the range of 3.0-7.0 μm .

16. (New) A spring manufactured from the spring steel wire according to claim 3.

17. (New) A spring manufactured from the spring steel wire according to claim 15.

18. (New) The spring steel wire according to claim 3, wherein the patenting comprises austenitization step in which a steel is heated at 900-1,050°C for 60 to 180 seconds and an isothermal transformation step in which thus austenitized steel is heated at 600-750°C for 20 to 100 seconds.